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Modelling Fluctuating Populations. *By R. M. Nisbet and W. S. C. Gurney. John Wiley and Sons, New York, New York, USA. 1982. 379 pages. $57.95. (Available at a 5% discount from the American Fisheries Society, postpaid in the USA.)*

In spite of the price, this book is an excellent text on population dynamics. The authors, who designed the book for readers with "widely varying levels of mathematical sophistication," provide a path through the text for the "initially less adept reader." Apart from the introduction, the book is divided into three parts, which are logically arranged. The four chapters in Part I are devoted to deterministic models, two chap-

ters in Part II to stochastic models, and three chapters in Part III to laboratory case studies. Four appendices covering specific mathematical topics complete the book.

In the introduction, the authors present some of their philosophy of modelling and define terms and concepts needed later in the text. This important chapter is well written and concise.

Part I begins with a detailed discussion of single-species models based on both difference and differential equations and additional basic concepts derived from neighborhood stability analysis. Driven systems, delayed regulation, and nonlinear effects, illustrated by figures and a few examples, also are discussed. In Chapters 4 and 5, single-species models are extended to include age structure, interactions with other species, and the effects of spatial heterogeneity. I found all chapters informative and clearly written.

In Part II, a mathematical formalism developed for birth and death processes in a static environment is extended to cover variable environments. The mathematical treatment becomes fairly complex (these were among the chapters that the authors recommended be skipped on the initial path through the book).

Part III comprises three laboratory case studies. In the first chapter, on oscillations in laboratory fly populations, the authors present and test a simple, time-delayed logistic model; they then develop and test a "more realistic model" of their own derivation. In the second chapter, on chemostat populations of unicellular algae, they explore and test time-delayed models, which they find only marginally useful. In the final chapter, they use experimental data from Huffaker and co-workers to model predator–prey quasicycles in a patchy environment. Only this final chapter is based on the material developed in Part II.

Appendices give brief introductions to: (1) calculus with functions of two or more variables; (2) the Dirac δ-function; (3) Fourier analysis; and (4) matrices. Readers with experience in these topics will find the appendices useful as refreshers, but those without experience will need to consult other sources.

Some additional features add to the usefulness of this book. Each chapter ends with "sources and suggested further readings," and with a set of problems (except for the introduction and three case-study chapters). The more difficult problems are marked with an asterisk.

In summary, the book is well written and contains few typographical errors, but it covers an area of population dynamics that requires some mathematical sophistication. The figures, tables, and examples complement the text. Fishery scientists, who are regularly involved in the quantitative analysis of fish populations, will find the ultimate usefulness of this book will depend on their particular problem and applicability of their data to the types of analyses described. Considering the price, I recommend that this book be obtained through library purchase rather than by the individual researcher.

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